Stray Creek Wildlife Effects

Relevant Laws, Regulations, and Policy and Compliance

Regulatory Framework

Clearwater National Forest Land and Resource Management Plan

The 1987 Forest Plan documents goals, objectives, and standards, for managing Forest wildlife species and habitats. Forest Plan goals (page II-2-2) provide for viable populations of all indigenous wildlife species, maintain and improve habitat for big-game, limit motorized use on selected big-game range, and manage habitat to contribute to the recovery of threatened and endangered species on the Forest. Objectives (FP page II-2-5) focus on maintenance and improvement on big-game ranges. Forest Plan standards are on page II-23-24.

Table 1. Stray Creek project consistency with Clearwater Forest Plan standards

Standard number	Standard Summary	Project Compliance Achieved By
Forest Wide Standards		
Wildlife and Fish		
a.	Provide the proper mix of hiding and thermal cover, forage, and protection from harassment during critical periods on big-game summer range (primarily elk) in accordance with criteria contained in the "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho."	The Project would increase opening for big-game summer range by 12% in the affected area. Elk analysis details are available in the project record. The affected elk analysis areas meets the Forest Plan Standards of maintaining elk habitat (see Elk effects).
c.	Provide habitat for snag-dependent indicator species (pileated woodpecker and goshawk) in accordance with guidelines provided in Appendix H.	Old growth and snag retention is maintained in project area as described in in the description of the proposed action. See Forest Vegetation analysis for meeting old growth standards.
f.	Provide an adequate amount of habitat to support the Clearwater Forest's assigned goal of ten endangered gray wolves as based on recommendations from the Northern Rocky Mountain Recovery Team.	Habitat is maintained or altered to provide increased big game forage over all seasons; thereby, increasing the prey base for wolves.
g.	Cooperate with future recovery efforts on behalf of the gray wolf, bald eagle, and grizzly bear.	Same location as block a: Standards f, g, & h. Habitat is managed for increased forage for big game. This would provide an increased prey base for the wolf and bear. Grizzly bear is not considered as a species with occupied habitat on the Forest. The project area is not considered as nesting habitat for the bald eagle.
j.	Cooperate with Idaho Fish and Game, Indian tribes, and other agencies in the management of wildlife and fish habitat.	Idaho Fish & Game, other local agencies, and Nez Perce Tribe have been notified of project activities through scoping and informal consultation.
Timber		

Standard number	Standard Summary	Project Compliance Achieved By
j.	Manage tree openings created by even-age timber harvest as follows: (3) Duration of openings - consider an opening no longer an opening when the density and height of the vegetation and watershed conditions meet the resource management objectives of the area. Big-Game Summer Range/Timber - In proposed El and E3 Management Areas. the minimum standard is to provide 25 percent elk habitat potential. New openings (regeneration cuts) can be planned adjacent to former openings as long as the former opening is certified as stocked and the area meets a minimum of 25 percent elk habitat potential after implementation of the proposed activity. The ID Team must assure that unit design optimizes wildlife objectives, both short-and long-term, within the overall objectives of the management area. Other resource requirements and objectives such as visual, watershed, silvicultural, etc., also must be met as applicable. The dispersal of timber size class objectives in the Regional Guide must be met.	The Project would increase opening for big-game summer range by 12% in the affected area. Elk analysis details are available in the project record. The affected elk analysis area meets the Forest Plan Standards of maintaining elk habitat (see Elk effects).
Management Area E1		
Wildlife and Fish b.	Manage for a minimum of 25 percent maximum elk potential habitat effectiveness. During Plan implementation and further analysis, determine whether remaining areas of El have potential for providing elk habitat. When analysis shows elk potential is limited by factors other than National Forest management, determinations may be made not to manage for elk. When habitat conditions warrant, managers are urged to exceed the 25 percent habitat standard. See Forestwide General Standards, in Chapter II	The proposed action would increase opening for big-game summer range by 12% in the affected area. Elk analysis details are available in the project record. The affected elk analysis area meets the Forest Plan Standards of maintaining elk habitat (see Elk effects).
Timber c.	Identify and maintain suitable old-growth stands and replacement habitats for snag and old-growth dependent wildlife species in accordance with criteria in Appendix H.	Old growth and snag retention is maintained in project area as described in in the description of the proposed action. See Forest Vegetation analysis for meeting old growth standards.

Federal Law

Endangered Species Act

No habitat or occurrence of threatened or endangered species is present in the Stray Creek project area.

Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (MBTA) prohibits taking of migratory birds, their parts, nests, eggs, and nestlings. Executive Order 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principals, measures, and practices into agency activities and to avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions. Additional direction comes from the MOU between the Forest Service and USFWS, signed December 2008. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the Forest Service and USFWS, in coordination with State, tribal, and local governments.

The proposed action is in compliance with the MBTA and Executive Order 13186, which authorizes activities including habitat protection, restoration, enhancement, necessary modification, and implementation of actions that benefit priority migratory bird species (Memorandum of Understanding Between USDA Forest Service and USDI Fish & Wildlife Service – 01-MU-11130117-028), described further below).

In late 2008, a Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

Project activities have the potential to affect migratory birds by altering habitat and displacing birds through disturbance. In areas where activities are ongoing, breeding birds may avoid or abandon habitats to avoid human activities and disturbance. Activities would be limited in time and spatial extent, so effects would be temporary and on a small scale. Proposed activities would not affect migratory birds at the planning unit scale. Forest Plan The project will maintain a mosaic of vegetation types and age classes to provide for a diversity of species, meets the requirements for snags and old growth (Appendix H of Forest Plan). The proposed action was designed to protect or enhance priority habitats for landbird species, including neotropical migratory species. Design criteria for project activities cover potential disturbances to birds, and allow for mitigations of the project if necessary.

National Forest Management Act

This act requires the Forest Service to provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives (16 USC 1604(g)(3)(B)). The Forest Service's focus for meeting the requirement of NFMA and implementing its regulations depends on assessing habitat to provide for diversity of species. The proposed action would be consistent with NFMA direction for diversity of animal communities. Although the proposed action analyzed in the Project may impact individual animals, the Project would not affect the viability of any species across its range.

Sensitive Species: Sensitive wildlife species are those that show evidence of a current or predicted downward trend in population numbers or habitat suitability that would substantially reduce species distribution. Federal laws and direction applicable to sensitive species (SS) include the NFMA and FSM 2670. The Forest is required to determine the potential effect of proposed activities on SS and to prepare biological evaluations. The Forest Service is bound by federal statutes (ESA, NFMA), regulations, and agency policy (FSM 2670) to conserve biological diversity on NFS lands and assure sensitive species populations do not decline or trend toward listing under the ESA. This document fulfills the requirements of the biological evaluation for sensitive species. The Proposed Actions would not affect sensitive species viability on federal lands, nor would it cause sensitive species to become federally listed as threatened or endangered.

Species Viability: The Proposed Action, in combination with and within the context of past, present, and reasonably foreseeable future management actions in the Analysis Area, would not affect population viability or distribution of native and desired nonnative vertebrate species on the Forest. At the Forest-wide scale, this Project would not disturb, agitate or bother populations to a degree that causes, or is likely to cause, a measurable decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior.

This analysis incorporates the effects on terrestrial sensitive species and fulfills the requirements of the required Biological Evaluation, per direction pertaining to the FSM and streamlining process (USDA Forest Service 1995). The streamlined process for doing biological evaluations for sensitive species focuses on the following two areas:

- Incorporating the Effects on Sensitive Species into the NEPA Document
- Summarizes the Conclusions of Effects of the Biological Evaluations for Sensitive Species

Data Sources

Modeled vegetation layers (from GIS applications) were used for interpretation of species habitats or potential habitat for the animals' life stages. Data related to vegetative features as potential wildlife species habitat was queried from the vegetation model V-Map, and other data on riparian, road, fire and harvest layers.

"*VMap is a remote sensed product which uses a combination of satellite imagery and airborne acquired imagery. The image data (i.e., pixels) are put through a process of aggregation to derive spatially cohesive units (i.e., polygons). A small portion of these polygons are then sampled through aerial photo interpretation and field data collection to determine their composition and through spatial statistics, unsampled polygons are given labels based on an analysis of the sampled polygons. Draft map products are then field verified and appropriate changes are made in the labeling algorithms. Final results are then used to populate the VMap base-level feature class. A variety of post-processing algorithms are then used to create the mid-level feature classes of the VMap database*." (Brown and Barber 2012).

Existing Condition

Fisher

Fishers are associated with mature coniferous forests and specific structural elements; particularly large trees and coarse woody debris (Samson, 2006b; Ruggiero et al. 1994). They inhabit mesic,

coniferous forest between 3,500–6,000 feet elevation, although habitat preference changes with season, age, and sex (Badry, 2004; NatureServe, 2019). Some researchers found that fishers did not select dry forest types with large representation of ponderosa or lodgepole pines (Schwartz et al. 2013, Olson et al. 2014). Many authors mention that fisher avoids open areas (Powell and Zielinski, 1994; Weir and Corbould, 2010; Schwartz et al. 2013; Sauder, 2014; and Sauder and Rachlow, 2014). Examples of such open areas include, grassy openings, meadows, and recently logged or severely burned areas within the past 15 years.

Fishers have a preference for structurally complex areas with multiple canopy layers, including understory shrubs and large amounts of woody debris. Ruggiero et al. (1994) concluded that riparian zones, high elevation old growth grand fir, and subalpine fir stands are important habitat components for fisher. Another set of researchers found that high elevation forested stands of lodgepole pine and sub-alpine fir were not considered as fisher habitat (Olsen et al. 2014). Fishers use "many different habitats for hunting as long as these areas provide overhead cover at either the stand or patch scales" (Weir and Harestead, 2003). Sufficient overhead cover in foraging habitat may be provided by either tree or shrub cover. Although fisher home ranges are consistently characterized by moderate to high proportions of mid- and late seral forests, there are few overarching patterns of selection for particular seral conditions or species compositions (Sauder and Rachlow, 2014). Raley et al. (2012) hypothesized that when fishers select home ranges, they benefit from including a diverse array of available forest conditions by increasing access to a greater diversity and abundance of prey species while still attaining habitat features important for reproduction and thermoregulation. Sauder and Rachlow's (2014) results are consistent with this contention.

For this analysis, potentially suitable habitat was determined using a model (Sauder, 2014) that combines three models of fisher habitat including: a climate model (Olson et al. 2014), a landscape-scale model (Sauder and Rachlow, 2014), and a home range scale model (Sauder and Rachlow, 2015). The Sauder (2014) model identifies relative probability of fisher occurrence and its continuity across the landscape. Modelled runs by the Biologist determined open areas, probable/general habitat and mature habitat. Open areas consisted of tree canopy cover at 10% or less: and were considered as habitats the fisher usually avoids (Sauder, 2014). Open areas contribute to fragmentation of the desired canopy cover for fisher. Fragmented open habitat consists of isolated openings that are surrounded by probable fisher habitat. When these open areas reach a cumulative 5% or greater representation in the project area, they contribute to fragmentation of fisher habitat that is less than optimal for the predator (Sauder 2014, Sauder and Rachlow 2014).

Stands classified as having a mature, mesic-mixed conifer forest (determined by the species with the greatest abundance of canopy cover, basal area, or trees per acre) were selected and intersected with "probable habitat" by the Sauder (2014) model. Selection criteria for mature forests were those areas greater than 10 inches DBH.

In summary, the most current science for the Nez Perce-Clearwater National Forest recommends landscapes that have greater than 50% mature forest arranged in contiguous, complex shapes with few isolated patches, and open areas comprising less than 5% of the area appear to constitute a forest pattern occupied by fishers (Sauder 2014, Sauder and Rachlow 2014).

Population Trends: Fishers have a global ranking of G5 (global rank for demonstrably widespread, abundant and secure)) and a state rank of S2 (imperiled), (Nature Serve 2019).

Gray Wolf

Gray wolf populations were extirpated from the western U.S. around the 1930s. Over time, individual wolves from Canada occasionally dispersed into Idaho. The gray wolf was listed as an endangered species in 1978. In the mid-1990s, gray wolves were introduced into central Idaho. By 2011 the USFWS finalized the delisting of the wolf in Idaho (IDFG and Nez Perce Tribe 2014).

Wolf habitat spans a broad range of elevations and habitat types. Key habitat components include: 1) a sufficient year-round prey base of ungulates and alternate prey; 2) suitable somewhat secluded denning and rendezvous sites; and 3) sufficient space with minimal exposure to humans (USDI FWS 1987). Denning/rendezvous sites, elk habitat effectiveness, and elk security areas (see Elk section) are used to assess existing conditions for wolves. Maintaining elk habitat effectiveness above minimum Forest Plan standards, providing elk security areas above minimum recommendations, and managing winter range to enhance forage productivity and quality would provide a sufficient prey base to sustain wolf populations at State objectives.

Population Trends: The gray wolf has a global ranking of G5 (global rank for demonstrably widespread, abundant and secure) and a state rank of S4 (apparently secure), (Nature Serve 2019).

Long-eared and Long-legged Myotis

Both bat species typically roost in snags, rock crevices, and caves. In forested areas, they have been found in snags and exfoliating tree bark. The long-legged myotis is more closely associated with coniferous forest habitat than the long-eared myotis. Both bats are known to forage together (Johnson, Lacki, & Baker, 2007).

The long-eared bat has been found roosting in the snags and stumps of Douglas-fir, western hemlock (Barclay & Kurta, 2007), western red cedar (Arnett & Hayes, 2009), and pine (Vonhof and Barclay, 1997)

Long-legged myotis are medium-sized bats that prefer large snags for roosting, but will also roost in live trees. Arnett and Hayes (2009) found that long-legged myotis infrequently roosted in snags or trees in stands less than 40 years old, and 58% of the snag roosts and 33% of the live tree roosts were located within riparian management buffers retained during harvest near small- and medium-sized perennial streams. Long-legged myotis roosted in snags in mid-seral (41-80 years) and old growth stands.

Population Trends: Nature Serve (2019) ranks the long-eared bat as G5- secure globally, and the long-legged bat as G4- apparently secure. Both species are considered in Idaho at the state rank of S3- rare or uncommon, but not imperiled.

Western Toad

Toads breed in temporary and permanent lakes, ponds, streams, and road ditches. They prefer shallow, warm areas with mud bottoms, and typically breed in May and June. Potential breeding and dispersal habitat occurs throughout the area along the network of riparian areas. Toads can be found from dry grasslands to moist subalpine forests, but optimal habitat is found in humid areas with moderate undergrowth. They are largely terrestrial, but generally found within fair proximity to water.

Adult western toads are largely terrestrial and are very active at night. They have been known to move up to 1 mile from their breeding habitats, (Bartelt et al. 2004) often into upland habitats (Bull 2006). Toads selected south-facing slopes, preferred open sites to forested settings, and sites with high density of burrows, rocks, logs, or rootwads that provided cover (Bull 2006). Burned and harvested sites were not avoided by western toads in Bull's study. Guscio et al. (2007) found western toad occurrence increased after wildfires and they used severely burned areas. Use shifted from severely burned to moderately burned areas in the late summer likely as a result of more ground/canopy cover and higher soil moistures.

Population Trends: The toad has a regional rank of G4 (apparently secure), and for Idaho the state rank is S2: imperiled (Nature Serve, 2018). Declines in abundance have been reported throughout the species' range due to disease and parasites.

Neotropical Migratory Birds

Neotropical migratory birds are species that breed and rear their young in the United States and Canada, then migrate south to winter in Mexico, the Caribbean Islands, and Central and South America. Under the National Forest Management Act (NFMA), the Forest Service is directed to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives" (P.L. 94-588, Sec 6 (g) (3) (B)). The January followed by the US Shorebird Conservation Plan and Executive Order 13186 (USA, 2001), and the January 2004 PIF North American Landbird Conservation Plan (Rich et al., 2007) all reference goals and objectives for integrating bird conservation into forest management and planning.

In late 2008, a Memorandum of Understanding between the USDA Forest Service and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

In the absence of activities or natural disturbances, the forest would continue grow towards a more closed canopy. Avian species that benefit are those that thrive in such habitats include those that nest and forage in the tree canopies: insect gleaners such as woodpeckers, some warblers, vireos, and seed eaters such as grosbeaks. For some neotropical migrants the project area may not provide the desired habitat, which usually results in the species moving on.

Northern Goshawk

The northern goshawk was identified as a Forest MIS for old-growth forest. Goshawks use large landscapes, integrating a diversity of vegetation types over several spatial scales to meet their life-cycle needs (John R. Squires & Kennedy, 2006). In "The Northern Goshawk Status Review," the USFWS found that the goshawk typically uses mature forest or larger trees for nesting habitat; however, it is considered a forest habitat generalist at larger spatial scales (USDIFWS, 1998). The FWS found no evidence that the goshawk is dependent on large, unbroken tracts of "old growth or mature forest."

Goshawks prey in habitats that contain snags, downed logs, woody debris, large trees, herbaceous and shrubby understories, and a mixture of stand structural stages (Wisdom et al., 2000). Foraging habitat for goshawks may occur along the edges of open areas; such as meadows, burned areas, timber units, streams and roads. Forage habitat is not considered limiting factor for the raptor on this Forest.

An Idaho study found that goshawk breeding home ranges in northern Idaho are about 12,720 acres for males; 9,540 acres for females (Moser, 2007). Though the Stray Creek PA appears too small to support a breeding range, the Project Area supports small patches of desirable habitat that may be used for nesting or rearing of a new cohort.

Nest areas are usually mature forest with large trees, relatively closed canopies (60-90%) and open understories (Squires and Kennedy, 2006). In central Idaho, goshawks nest in a variety of forest stands that are comprised of mature trees with relatively high canopy cover and open understories (Moser, 2007). Favored habitats typically are located in forest stands having only 1 or 2 canopy levels with an open or mixed-density understory (ibid). The researcher found the average size of a nesting area in his Idaho study at around 170 ha, or 420 acres.

Nesting habitat was chosen indicator as it is the primary limiting factor for goshawks and is represented by a much narrower range of vegetation structure and composition than the post-fledgling areas and forage area.

Home ranges are likely not defended from other goshawks, with the exceptions of the nest area and post-fledging area (Brewer, Bush, Canfield, & Dohmen, 2009). Home ranges of adjacent pairs may overlap (J. R. Squires & Reynolds, 1997); Squires and Kennedy, 2006). Goshawks have been found to use the same nesting area for decades, and goshawk territories typically contain a number of alternate nests (Moser, 2007). Goshawks appear to range over large areas and use a variety of habitats outside of the nesting area (Kennedy, 2003).

Population Trends: The goshawk is rated secure across its range (global rank G5) and S3 in Idaho; which is rare or uncommon, but not imperiled (Nature Serve 2019).

Pileated Woodpecker

The pileated woodpecker is another Clearwater National Forest MIS for old growth forest and large snag habitat. Pileated woodpeckers are large, cavity-nesting birds associated with late successional stage forests, but also may use younger forests that have scattered, large, dead trees (Bull & Jackson, 1995). The woodpecker is common in both cut and uncut mid-elevation forests, and appear to do well in a matrix of forest types (Hutto, 1995). One group of researchers conducted a study on the density of pileated woodpecker nesting pairs in areas before and after timber harvest activities (Bull et al. 2007). In six of the seven study areas, the density of the nesting pairs were unchanged, or increased or decreased by only one pair. In these sampled areas, the amount of mature and old forests decreased by less than 25%, with consistent pileated woodpecker densities.

Feeding habitat for pileated woodpeckers is highly dependent on the availability of carpenter ants which make up the majority of their food supply (Aney & McClelland, 1990). Preferred feeding habitats have high densities of snags and logs, dense canopies, and tall ground cover, with more than 10% of the ground area covered by logs.

The current condition of nesting habitat is considered the most limiting factor for pileated woodpeckers. Nesting habitat is a more specialized range of vegetation structure and composition than the stand age and structure for foraging habitat. The nest tree is the most important variable to estimate breeding habitat use by the pileated woodpecker (Kirk & Naylor, 1996); (Giese & Cuthbert, 2003).

The mean size of nest trees ranged from 28" dbh in Montana (Aney and McClelland, 1990) to 33" dbh in Oregon (Bull and Jackson, 1995). The minimum canopy cover selected by pileated woodpeckers for nesting stands ranges from 15 to 60 percent depending on the habitat type (Bull, Holthausen, & Henjum, 1992), (Bull & Holthausen, 1993); (Bonar, 2001).

Territories of nesting pairs cover 500-1000 acres in Montana, 1000-1300 acres in western Oregon, 320-600 acres in northeastern Oregon (Aney and McClelland, 1990), and about 1,000 acres in another Oregon study (Bull and Holthausen, 1993). Not every stand within a bird's home range is used as feeding habitat, and the range of a nesting pair is partly determined by the amount of suitable feeding habitat in proximity to the nest site.

Population Trends: The pileated woodpecker is rated secure across its range (global rank G5) and apparently secure (state rank S4) in the state of Idaho (Nature Serve, 2019).

Rocky Mountain Elk

Elk is a management indicator species for commonly hunted big game species, and an MIS for general forest seral species easily affected by management activities on the Clearwater National Forest.

Elk are habitat generalists and use a diversity of forest types and structures that provide forage and hiding cover (Unsworth, Kuck, Garton, & Butterfield, 1998). They forage in meadows and early seral communities from spring through early summer, use more closed canopies from late summer through fall, and rely upon low elevation, warm aspect, and snow-free or snow-limited areas for foraging in the winter. Adult bulls often winter at much higher elevations than cows and immature elk. Elk also require forest cover for security and thermal regulation (Ward Thomas, Black, Scherzinger, & Pedersen, 1979), although the results of (Cook, Irwin, Bryant, Riggs, & Thomas, 1998) did not find that such forest cover significantly enhanced the condition of elk in winter or summer, and it did not assess effects of topographic or other landscape features that could enhance energy conservation by protecting from wind or enhancing absorption of solar radiation.

Nutritional resources are the most important factors associated with elk summer resource selection (D. Ranglack et al., 2016), Alldredge et al, 2002). Recent nutritional studies have employed models for analyzing seasonal forage to the autumn body condition and pregnancy rates (Cook et al. 2017, 2016), calf recruitment (Middleton et al, 2013), and body-fat-pregnancy relationships (Proffitt, Hebblewhite, Peters, Hupp, & Shamhart, 2016); Ranglack et al, 2016). Wildfire, prescribed fire and thinning would create forage for elk, though nutritional quality of the new or recovering forage would vary during the growing seasons (Proffitt et al. 2016, (Long, Rachlow, & Kif, 2008). Selection of such forage would vary among elk bulls and cows (Long, Rachlow, Kie, & Vavra, 2008) and (Long, Rachlow, & Kie, 2009).

Roads built into elk habitat increase hunter access, increasing elk vulnerability to harvest (Unsworth, Kuck, Scott, & Garton, 1993), (Christensen, Lyon, & Unsworth, 1993). Other literature on elk modelling has suggested buffers for road effects (D. H. Ranglack et al., 2017)

Frair et al, 2008; (M. M. Rowland, Wisdom, Johnson, & Penninger, 2005), (M. M. Rowland, Wisdom, Johnson, & Kie, 2000), size of elk unit to be analyzed (Rowland et al, 2005; Boyce et al, 2003; Unsworth et al. 1998; Christensen et al, 1993), the influence of different road types on elk space use across seasons and by sex (Montgomery et al. 2012), and other elk habitat considerations. Field observations by the biologist, other forest personnel and public individuals show that elk may use roads as evidenced by elk tracks seen on roads. In some cases creation of temporary roads on ridges may be used by elk as game trails.

Some of the more recent literature explores factors influencing elk recruitment across habitats in the western U.S. The researchers considered effects of predators, productivity of forage and precipitation on elk recruitment (Lukacs et al. 2018). Rowland et al. (2018) discuss a regional model of elk nutrition and habitat use in Western Oregon and Washington. Their model considers distances of roads open to public motorized use, distance to cover-forage edge, slope of terrain and habitats high in dietary digestible energy.

Stray Creek Existing condition

The project area is modelled at high nutritional capacity: DDE (levels of digestible energy in elk diets during summer). The model includes covariates of nutrition, human disturbance, vegetation, and physical conditions; utilized for nutritional resource selection and population-level estimates of body fat and pregnancy rates of lactating elk (Rowland et al. 2018). The researchers also developed an elk habitat model which included the following: DDE, distance to closest roads open to public motorized access, distance to cover-forage edge and slope. Elk preferred habitats that were relatively high in DDE, far from roads, close to cover-forage edges, and on gentle slopes. Apparently, the Stray Creek project area meets the characteristics of the model.

Shiras Moose

The moose is a forest MIS species for mature timber with understories of Pacific yew. The latter habitat is considered primary winter habitat for the ungulate (Pierce and Peek 1984). Other preferred forage (besides yew) of moose include false huckleberry, Scouler willow, serviceberry and alder. Research in the Canadian Rockies found moose browsed lodgepole pine and subalpine fir (Poole and Stuart-Smith 2005). During late spring to fall moose have been seen in shrubfields, riparian areas and locations recently burned or timber harvest units.

Pacific yew was declining in the early 1990s due to the discovery of taxol, an anticancer agent found in the tissues of the plant (Busing and Spies 1995). In anticipation of the increased demand and harvest of the plant, the Forest Service implemented interim management guidelines for the conservation of yew in 1992. The yew is a slow-growing plant that is most abundant mature to old-growth forests.

Moose is a big-game species found in relatively low numbers, scattered across the Forest with the exception of the Powell Ranger District. Near this Idaho/Montana boundary, moose occur in larger concentrations (USDA Forest Service 1987). A statewide report found that previous history of moose indicated a decline, but recently moose populations in the central Idaho Wilderness and other areas of the Clearwater are stabilizing (IDFG 2016b). Some reasons the study offered were moose tags have been reduced, and moose range has increased in areas once thought to be less than optimal habitat.

The project area is located in the eastern portion of GMU 10A. The management direction for the game management unit is to allow moose populations to increase where habitat and other

conditions will support expansion, moose harvest will be adjusted according to hunter success rates, and known mortalities will be documented (IDFG 2016). The IDFG manages hunting pressure by controlled hunts, which disperses hunters and/or directs harvest in specific areas. The agency finds the expansion of wolves on moose populations are as yet undetermined, and other factors- disease, parasites and nutritional data are still being evaluated across the state.

Population Trends: The moose is rated as G5 (abundant and secure in the U.S. and Canada), and S5 in Idaho: abundant and secure (Nature Serve 2017). A recent publication estimate around 10,000 moose in Idaho (Nadeau et al. 2017). In the project area, recent

Environmental Impacts

No Action

If no action, natural processes would continue such as wildfires, windstorms, insect and disease outbreaks, and other weather events may impact the habitats of the wildlife species analyzed below. Habitat would persist as described in the existing condition.

Proposed Action

Sensitive Species

Fisher

The fisher is also identified as a management indicator species under the Forest Plan and an Idaho species of greatest conservation need (IDFG 2018). One record of a fisher trapped and released in the Stray Creek project area occurred in 1989.

Sauder (2014) estimated the average home range for a male fisher is about 24,300 acres and 12,200 acres for a female. The Stray Creek project area encompasses about 839 acres; which is too small for evaluating the impacts of the proposed activities on a fisher's territory. Therefore, the Biologist expanded the analysis areas on federal lands to the acreage used by each gender.

Direct and Indirect Effects

Fisher habitat (general and mature) in the project area comprises all but 93 acres in both male and female territories. The proposed action would harvest 128 acres of fisher mature habitat, and 330 acres of general fisher habitat. Temporary roads would be constructed for access to timber operations. During implementation, a fisher may be disturbed or displaced by the harvest activities (noise and movement by man and machine). The timber harvest would create openings that the fisher would likely avoid. However, the predator may forage along the edge of the units and undisturbed forest.

Cumulative Effects

The cumulative effects boundaries is the fisher territory described above. The cumulative effects timeframe is 40+ years; as the period for regeneration harvest areas to develop into mature habitat of 10" dbh or greater (as defined for fisher habitat by Sauder and Rachlow, 2014). Change in fisher habitat in this territory would occur from the Lolo Insect & Disease project. The combined reduction from the proposed action and the Lolo Insect & Disease project of mature fisher habitat for the male territory would be around 1,037 acres, or 4.3% of the territory. For the female fisher territory, the reduction would occur in 429 acres (3.5%) of mature habitat. Disturbance and

displacement of an individual fisher is also possible. Additionally, slash burning, tree planting, road building and decommissioning, fire suppression, and wood cutting are other activities that may perturb a fisher near such activities.

Habitat fragmentation would remain below the 5% threshold recommended by researchers (Sauder 2014, Sauder and Rachlow 2015). No harvest would occur in old growth or riparian areas, which would retain resting and denning habitat, as well as movement corridors for the fisher. Mature tree habitat (10"+ dbh) would remain above 50% within the territories.

Determination

Areas affected by project activities (harvest and roads) would provide at least 10% cover in a fisher territory; about 10-15 years post project completion. Forty years after the project is completed, mature forest would return to the affected areas, unless other disturbances (man-made or natural events) occur. The effects of the Stray Creek Project may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of fisher.

Gray Wolf

After the wolf was de-listed in Idaho, 2011, population control plans on the predator has intensified. Two major issues surrounding wolf management are depredations on livestock, and impact of predation on elk, moose, and other ungulates (IDFG 2017). The goal of the state management agency is to meet the intent of the 2002 IDFG Wolf Plan: maintain about 15 wolf packs in the state. Wolf zones are no longer used as an analysis tool. Instead, incidents of livestock depredations are tracked by Game Management Units or GMUs. The project area is located in a portion of GMU 10a (Dworshak Elk Zone). Currently, this unit is considered at a moderate intensity of predation on Idaho elk populations identified in the IDFG elk management plan of 2014 (IDFG 2017).

Direct and Indirect Effects

The proposed action would not affect wolf habitat. Implementation of timber harvest operations (noise and movement by man and machine) may temporarily agitate or displace a wolf from the project area during periods of activity. Wolves are known to return to harvested units during hours of darkness to hunt for prey. The project area is part of a larger elk analysis area, which meets the Forest Plan guidelines for elk habitat effectiveness (see elk section).

Cumulative Effects

The effects area is the Dworshak GMU (318 square miles). The GMU is large enough to provide year-round prey, secluded denning and rendezvous sites, and secluded areas from human contact. The time frame for a potential increase of big game in this area is about 15 years post after harvest operations.

The Stray Creek Project would create about 425 acres of openings in tree habitat that would provide forage for big game (elk, deer, moose); which are important prey for the wolf. The early forest vegetation would provide forage for elk and other ungulates from 2-15 years. As the big game return, the wolf would likely visit these areas for potential prey. Seedlings will be planted, and would offer hiding cover for elk in a span of 10-20 years. This cover in affected units would reduce detection of elk along open roads during hunting season.

Firewood cutting is likely to occur along roads open to public motorized access, and may temporarily displace a wolf near the area of activity. Fire suppression would continue which would displace wolves in the area of operations. Again, forest openings created by fire would produce future forage for big game and offer the wolf more opportunities for prey.

Determination

Control of wolves would continue until the state has reached the objective of 15 wolf packs. The effects of the Stray Creek Project may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the gray wolf.

Long-eared and Long-legged Myotis

Modelled habitat in the project area is estimated at 374 acres (trees of the size of 15 inches or greater).

Direct and Indirect Effects

Timber harvest is proposed in 134 acres (less than 36%) of potential bat habitat. None of this would occur in old growth or riparian areas. The regeneration harvests would retain a few large trees or snags that may provide roost habitat for the bats. However, the harvest activity would reduce habitat in the project area. The action alternative would disturb, displace or maim individual bats in the proposed units. If harvest occurs during the winter season, bats would not be affected as they would be present in their wintering roosts in the southern part of the state.

Implementation of the proposed action would occur over a period of at least 2 years; thereby, not all units would be treated at once, and not all activities would occur at the same time. Treatments would reduce tree canopy cover, and reduce potential habitat. As the understory recovers, forbs and shrubs would increase and offer habitat for insects and bugs. Plants that produce flowers would attract butterflies and moths, while the dead or dying trees would provide habitat for beetles and other bugs. Both butterflies and beetles are the preferred staple of the long-eared and long-legged bat's diet (Lacki et al. 2007). The pulse in bat forage would last until the tree canopy shades out the understory; about ten to fifteen years.

Temporary roads utilized for harvest operations would not be open to the public. Upon project completion all temporary roads would be obliterated.

Cumulative Effects

The project area is the analysis area, as it is large enough to host many bats for the summer migration season. The time period relevant to bat presence in the analysis area is late spring to early autumn: the period of their migration for richer food sources.

Firewood cutting would be remain limited to the low mileage of road open to the public; which remains the same as the existing condition. Fire suppression would continue, which may reduce the loss of bat habitat to wildfire.

Determination

The proposed action may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the analyzed myotis species. Harvest prescriptions would retain large trees and snags within units, and design

criteria avoids effects to habitat by coordinating prescribed burn efforts to reduce disturbance and retain trees with cavities and/or large nests.

Western Toad

Breeding and larval stage development occurs in water: ponds, puddles, slow-moving streams and so on. About 181 acres of such breeding habitat is available in the project area during spring and early summer. Upland habitat in the rest of the project area comprises 658 acres.

Direct and Indirect Effects

No project activities would occur in riparian areas. Therefore, breeding and development of young larvae to adults would occur without loss or disturbance of habitat in the moister habitats. About 425acres of upland habitat would be affected by timber harvest. All activities have the potential to disturb, displace, maim or kill an individual toad outside of a riparian zone during project implementation.

About 64% of upland habitat for the toad in the project area would be affected by timber harvest. Downed woody material would increase exponentially, which provides hiding and burrowing cover for adult toads, as well as other invertebrates that the amphibian preys on.

Cumulative Effects

Fire suppression would continue to be implemented if potential harmful effects are anticipated to human-owned property.

Determination

The proposed action may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species of the western toad. Harvest prescriptions would retain downed wood and snags (future downed wood) within units, and design criteria avoids effects to potential breeding habitat (all riparian areas).

Neotropical Migratory Birds

The project area is 98 percent forested: therefore, migratory birds that prefer open areas without trees would have about 10 acres of available habitat. More open habitats are available on private or state-owned holdings, to the west of the project area. Ponderosa pine and Douglas-fir occupy about 78 acres in the project area. This habitat may support migrants such as the flammulated owl, American robin, and western tanager. Closed forest of grand fir and western red cedar dominate about 750 acres in the project area. The denser forest would support thrushes, kinglets, and some warblers.

Direct and Indirect Effects

In the absence of activities or natural disturbances, the forest would continue grow towards a more closed canopy. Avian species that benefit are those that thrive in such habitats include those that nest and forage in the tree canopies: insect gleaners such as woodpeckers, some warblers, vireos, and seed eaters such as grosbeaks. For some neotropical migrants the project area may not provide the desired habitat, which usually results in the species moving on.

Proposed harvest activities would occur in 425 acres. Temporary roads would reduce less than one acre of forest habitat. No harvest activities or temporary roads would occur in riparian areas. Newly harvested or burnt areas would provide habitat for migrant species that prefer open

habitats. Conversely, this change would not be favorable to avian species that prefer closed habitats. The latter would move to adjacent areas of forest within or adjacent to the affected areas. Harvested units would recover from native seed sources in the soil and planted trees. During the first 15 years after timber sale completions, growing shrubs and trees would offer good opportunities for nesting songbirds. A greater quantity and diversity of invertebrates would be available in this life stage, which would benefit bird insectivores. As tree densities increase, the bird species that prefer closed habitats would find these areas more suitable for nesting habitat. Noise and movement of machinery and other human activity may disturb migrant birds. The operating season may disrupt some nesting birds in or near areas of project activities. Harvest operations would begin in July, when some bird species may have fledglings present near their nest. However, most of the timber harvest and prescribed burning would occur after young birds have left the nest. No activities would occur in old growth.

Timber-harvested units would be restocked by tree planting, while burned areas would recover from native seed sources. During the first 15 years after timber sale completions, growing shrubs and trees would offer good opportunities for nesting songbirds. A greater quantity and diversity of invertebrates would be available in this life stage, which would benefit bird insectivores. Proposed activities that reduce vegetation would be beneficial to bird species that prefer more open habitats (shrubfields, small meadows or open fields). Species that would benefit include hummingbirds, flycatchers, red-tailed hawk, sparrows, and some ground-nesting birds.

Cumulative Effects

The cumulative effects area is the project area because it is large enough to offer habitat for a breeding cycle of forest-preferring migratory bird species. The proposed action would be completed in about two-four years. Fire suppression may occur for wildfires that may break out in the area. A wildfire and suppression efforts may displace or harm an individual migratory bird. However, most fires occur after the nesting season, and the new generation of young birds would have the ability to fly away from danger posed by a fire or suppression efforts.

Long-term effects would be the benefit of increased vegetation for forest preferring migratory birds. Maintenance of vegetation to open ponderosa pine stands would benefit the migratory flammulated owl. No new permanent openings, such as roads would occur in the project area. Temporary openings created by harvest may encourage predators (ravens, starlings) to compete with neotropical migrants. Additionally, cowbirds may be attracted by the edge-effect habitat of units to seek "host nests" for parasitism of neotropical migrants. Temporary roads would be decommissioned after use, and would provide potential habitat (vegetation) for migratory birds. New vegetation would offer nectar (flowers) or invertebrates that live or feed on the plants. Flower nectar would provide food for hummingbirds, while an increase in insects

Determination

The proposed action may impact individuals or their habitat, but is not expected to result in a loss of viability in the planning area, nor cause a trend toward federal listing of migratory birds, because the short period of timber operations, and design criteria (WL-1, and 2) would maintain potential habitat and minimize disturbance during the period of migratory bird presence in the area.

Management Indicatory Species

Northern Goshawk

The northern gosh aw is a management indicator species for old growth. Current status of potential nesting habitat for the goshawk is about 38 acres of potential nesting habitat and 828 acres of foraging habitat, based on the metrics recorded in a study conducted on the Forest (Moser 2007). Old growth presence is small (45 acres) in the project.

Direct and Indirect Effects

No old growth would be harvested in the project area. The proposed action would harvest and burn less than 5 acres of potential nesting habitat. The construction of new temporary roads would affect less than one acre of habitat. The proposed alternative would reduce potential nesting habitat by 13% in the project area. Other harvest treatments would reduce tree habitat in potential foraging areas. However, large trees and other forest habitat that that would be left, would continue to provide foraging areas for the raptor.

Project activities may disturb a nesting pair of goshawks. Design criteria would protect a nest (WL-2 and 3), and prohibit activities in an active post-fledgling area (WL-4).

Cumulative Effects

Fire suppression would occur in the event of a wildfire within the project area that may displace a goshawk.

Conclusion

The proposed project activities may disturb or displace an individual goshawk. The proposed action may impact individuals or their habitat, but is not expected to result in a loss of viability for the goshawk in the planning area, nor cause a trend toward federal listing of the species.

Pileated Woodpecker

The pileated woodpecker is a management indicator species for old growth and large snag habitat. The bird's nesting habitat is similar the goshawk, except it would tolerate canopy cover levels more open than the raptor. The potential nesting habitat in the project area is estimated at 45 acres.

Direct and Indirect Effects

The proposed action would reduce the same potential nesting habitat for both the goshawk and woodpecker (5 acres). This would reduce the woodpecker's habitat in the proposed action by 11%. Some large tree habitat, as well as snags would be retained for woodpecker foraging habitat. Project activities may disturb a nesting pair of woodpeckers. Design criteria (WL-2) would protect a discovered nest.

Cumulative Effects

Fire suppression would occur in the event of a wildfire within the project area that may displace a pileated woodpecker.

Conclusion

The proposed project activities may disturb or displace an individual pileated woodpecker. The proposed action may impact individuals or their habitat, but is not expected to result in a loss of viability for the pileated woodpecker in the planning area, nor cause a trend toward federal listing of the species.

Rocky Mountain Elk

The elk is a management indicatory species for big game habitats. The project area is located in summer elk range, and in a portion of one elk analysis area (EAA). Forest Plan guidelines for the affected Yakus EAA is to maintain at least 25% elk habitat effectiveness (EHE) (Forest-wide standard 7.j.(3)). The EHE calculation is a sum of calculations based on the following: size of the EAA; size of certain areas for security, openings, hiding cover, road densities, elk use related to cattle density, and size and distribution of cover and forage. As a project is implemented, EHE may be affected by changes in the above metrics. Calculations for each EAA during each phase of the activities are available in the project record.

Direct and Indirect Effects

The existing condition of EHE is 47% for the Yakus EAA. The proposed action would increase openings in the EAAs due to timber harvest, and increase road densities (opening some currently closed roads or building temporary roads) to access timber. Such actions reduce hiding cover and security areas. EHE usually decreases from these activities. Prescribed burns would reduce fuels in the understory, and minimally affect hiding cover. This treatment would encourage growth of a new understory of plants and shrubs for big game forage.

After the proposed action is completed, road densities usually drop, due to closing and/or decommissioning roads used in the harvest operations. Road closures usually increase elk security. Table 2 tracks the changes in the EAA located in this project area.

Table 2. Yakus EAA (3,987 acres)

Time Frame	Road Density (mi/mi^2)	Security (%)	Openings (acres)	EHE (%)
Existing	1.3	15	216	47
Proposed Action	1.5	7	641	47
Post Action	1.3	13	641	48

The Yakus Point EAA would gain 425 acres of potential forage for elk from harvest treatments in the proposed action. During implementation of the action alternatives, elk security would decrease due to the loss of hiding cover in harvested units, and the use of some previously closed roads and construction of temporary roads to access timber. Elk would move away from the disturbance created by timber harvest or burning activities to other security areas. The animal is known to return to harvest units during hours of darkness to forage on vegetation. After implementation road densities would return to the existing condition. EHE drops due to decrease in hiding cover from the harvest activity.

Elk vulnerability is linked to hunter and motorized route densities to predict elk mortality rates. The temporary and other roads opened for harvest activities would not be maintained for public motorized access, and such use is discouraged. However, hunters may access the area by non-motorized means to hunt big game. The openings created by timber harvest may provide hunting opportunities for elk.

Upon completion of timber harvest, tree-planting contractors would restock the units. Vegetative screening would increase (10-15 years) to a density where an elk would not be visible to a human who is a distance of 200 feet or greater from the animal. As this "hiding" cover increases, it adds to the amount of elk security in the area. Increased elk security would also occur from decreased road densities. Together, these factors reduce elk vulnerability.

All temporary roads used during the implementation of the project would be decommissioned upon completion of the harvest activities. Elk vulnerability would decrease to the same levels as the existing condition as vegetative hiding cover recovers.

Cumulative Effects

Activities proposed for the project area may disturb or temporarily displace individual elk. Few roads are open to the public motorized traffic: about 10 miles in the Yakus EAA. The proposed action would increase openings (future forage habitat) by 12% in the EAA.

Firewood cutting would continue along the few roads in the project area. This activity would have an immeasurable effect, as only dead or dying trees along a road open to motorized traffic may be affected. The half-mile buffer for open roads would account for firewood collection as another activity along an open road that would reduce security for elk. Fire suppression would continue, which would reduce the recruitment of early seral habitat from an uncontained wildfire. Both activities may disturb or displace elk.

Conclusion

Some disturbance to elk would occur during the implementation of the action alternative: may impact individuals or their habitat, but is not expected to result in a loss of viability in the planning area, nor cause a trend toward federal listing of the Rocky Mountain Elk. The Stray Creek Project would increase forage habitat for elk, while meeting the recommended guidelines for managing elk habitat. Project design criteria (WL-1) would maintain hiding cover and minimize disturbance during the elk calving season.

Shiras Moose

Moose are a management indicator species for big game species and old-growth/Pacific yew habitats. Potential habitat (Pierce and Peek, 1984) was queried as grand fir at or above 15" dbh. Current potential moose habitat in the project area is about 270 acres.

Direct and Indirect Effects

The proposed action would reduce potential moose habitat in the project area by about 134 acres. Activities that would reduce tree habitat include temporary roads, timber harvest and burns in units that would be replanted with favored tree species. In 3-15 years forage for moose would be available as understory herbs and shrubs recover. Hiding cover would be available after 15 years, and would offer screening of an individual moose at 200 feet or greater from an open road. Project activities may disturb or displace an individual moose. Operations would occur during daylight hours, and moose may wander back into the units to feed on vegetation that has become available from logging operations during periods of darkness.

Cumulative Effects

The cumulative effects analysis area is the project area. Timeframe for recovery of potential moose habitat from a timber harvest is about 50 years: the period for a tree to attain the size and cover that contributes to moose habitat. The proposed action would reduce moose habitat by 50% in the project area. Wildfire suppression would continue, and may reduce the size of moose habitat lost if the fire was not contained.

Conclusion

The proposed action may impact individuals or their habitat, but is not expected to result in a loss of viability of moose in the project area, nor cause a trend toward federal listing.

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